UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/810,938	03/16/2001	Gudmundur Hjartarson	10.1013	7247

21919 7590 05/11/2007
MEREK, BLACKMON & VOORHEES, LLC
673 S. WASHINGTON ST.
ALEXANDRIA, VA 22314

EXAMINER	
LEE, ANDREW CHUNG CHEUNG	
ART UNIT	PAPER NUMBER
2616	
MAIL DATE	DELIVERY MODE
05/11/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	09/810,938	HJARTARSON ET AL.	
	Examiner	Art Unit	
	Andrew C. Lee	2616	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 February 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-21* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-18 and 20* is/are rejected.

7)☒ Claim(s) *19 and 21* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____* is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1, 2, 3, 4, 5, 6, 7, 8, 9,10,11,13, 14, 15, 16, 17,18, 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over O'Toole et al. (US 5889856) in view of Cioffi et al. (US 6473438 B1).

Regarding Claim 1, O'Toole et al. disclose the limitation of a line interface for coupling a twisted pair telephone line with a communications network (Fig. 6, element 58 Integrated line card as line interface and element 20 telephone line as twisted pair telephone line, column 7, lines 2 – 5), comprising: a broadband analog front end circuit (element 44 A/D converter as analog front end circuit) coupling said twisted pair telephone line with said line interface; and a programmable filter (Fig. 6, element 50, digital signal processor) coupled to receive an output signal from said broadband analog front end circuit (Fig. 6, elements 50, Digital Signal processor as programmable filter, DSP can be programmable to perform digital filtering) and O'Toole et al. disclose implicitly configured to filter frequency bands of said output signal into a plurality of separate, variable bandwidth transmission channels (recited "DSP performs a high-pass filter, the output of the high-pass digital filtering...; DSP also performs a low-pass filter, the output of low-pass filtering ....." as output signal into a plurality of separate, variable

bandwidth transmission channel) wherein said plurality of separate variable bandwidth transmission channels are associated with said communications network (Fig. 6, elements 30, high-speed ADSL data pathway and element 34 PCM highway as associated with said communications network, column 8, lines 8 – 11; 18 – 21), and wherein said frequency bands (Fig. 7, element 62, >4KHz, and element 66 100Hz – 4KHz frequencies as frequency bands) and said variable bandwidths are determined by programming said programmable filter (column 7, lines 62 – 65; recited DSP can be programmed to perform digital filtering; column 8, lines 49 – 50, high-pass filter; column 9, lines 1 – 2, band-pass filter).

O'Toole et al. do not disclose the limitation of configured to filter frequency bands of said output signal into a plurality of separate, variable bandwidth transmission channels.

Cioffi et al. disclose the limitation of configured to filter frequency bands of said output signal into a plurality of separate, variable bandwidth transmission channels ("inherently partitions a transmission medium into a number of sub-channels that each carry data independently. The data on each sub-channel can correspond to a different signal or can be aggregated into higher data rates" correlates to configured to filter frequency bands of said output signal into a plurality of separate, variable bandwidth transmission channels; column 7, lines 59 – 68, column 8, lines 1 – 5).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify O'Toole et al. to include configuring to filter frequency bands of said output signal into a plurality of separate, variable bandwidth transmission

channels as taught by Cioffi et al. in order to provide a wide variety of data transmission schemes including Asymmetric Digital Subscriber Line systems that include the transmission of signals over twisted pair, fiber and/or hybrid telephone lines, cable systems that include the transmission of signals over a coaxial cable, and digital cellular television systems that include the transmission of radio signals (as suggested by Cioffi et al., see column 3, lines 10 – 16), and to provide "high spectral efficiencies and can adaptively avoid various signal distortion and noise problems" (Cioffi, column 1, lines 23 – 25).

Regarding Claim 2, O'Toole et al. disclose the limitation of communications network comprises a data network (Fig. 6, element 30, high–speed ADSL data pathway; column 8, lines 8 – 11, 54 – 55, recited for transmission to the Internet as data network) and a voice network (Fig. 6, element 34 PCM highway, column 8, lines 18 – 21, column 9, lines 15 – 20, recited voice in Public Switched Telephone Network as voice network).

Regarding Claim 3, O'Toole et al. disclose the limitation of line interface comprising: an analog to digital converter circuit (Fig. 6, element 44 A/D converter as analog front end circuit), coupled between said broadband analog front end circuit (Fig. 6, elements 59, 54, 56, column 7, lines 31 – 36, recited these analog circuits as analog front end circuit) and said programmable filter (Fig. 6; element 50 DSP as programmable filter), configured to convert said output signal to a digital signal (column 6, lines 47 – 50, recited a sequence of digital values from A/D as converting said output signal to a digital

signal), wherein said programmable filter is a digital programmable filter (Fig. 6; element 50 DSP as programmable filter, column 7, lines 62 – 65).

Regarding Claim 4, O'Toole et al. disclose the limitation of plurality of separate transmission channels (recited "DSP performs a high-pass filter, the output of the high-pass digital filtering...; DSP also performs a low-pass filter, the output of low-pass filtering ....." as output signal into a plurality of separate, transmission channel) are directed to a plurality of different service providers (Fig. 6, element 30, high–speed ADSL data pathway; column 8, lines 8 – 11, 54 – 55, recited for transmission to the Internet as data network; Fig. 6, element 34 PCM highway, column 8, lines 18 – 21, column 9, lines 15 – 20, recited voice in Public Switched Telephone Network as voice network, voice network and data network as different service providers).

Regarding Claim 5, O'Toole et al. disclose the limitation of plurality of separate transmission channels are directed to a plurality of different modulation schemes (column 6, lines 51 – 58, recited high frequency components are decoded and formatted and low-frequency components are decoded and re-coded for transmission over PCM as different modulation schemes; column 10, lines 14 – 16).

Regarding Claim 6, O'Toole et al. disclose the limitation of the line interface of said programmable filter is programmed with software (column 8, lines 34 – 35, recited implemented as routines that are stored in memory as programmed with software).

Regarding Claim 7, O'Toole et al. disclose the limitation of the line interface wherein said software is downloaded to said programmable filter (column 7, lines 54 – 61, recited allow for code updates as software is downloaded).

Regarding Claim 8, O'Toole et al. disclose the limitation of the line interface wherein said plurality of separate frequency bands are determined according to a protocol including at least one of POTS, ISDN, ADSL, VDSL, SDSL, IDSL, HDSL, and HDSL2 (column 4, lines 50 – 60, recited IDSL, HDSL as at least one of POTS, ISDN, ADSL, VDSL, SDSL, IDSL, HDSL, and HDSL2).

Regarding claim 9, O'Toole et al. disclose the limitation of the line interface wherein said plurality of separate frequency bands are determined according to a protocol including at least one of POTS, ISDN, ADSL, VDSL, SDSL, IDSL, HDSL, and HDSL2.

O'Toole et al. do not disclose the line interface of claimed wherein said ADSL is one of the full rate ADSL, G. Lite, CAP, and QAM.

Cioffi et al. disclose the limitation of the line interface of claimed wherein said ADSL is one of the full rate ADSL, G. Lite, CAP, and QAM ("a QAM encoder" correlates to the line interface of claimed wherein said ADSL is one of the full rate ADSL, G. Lite, CAP, and QAM; column 27, lines 16 – 19).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify O'Toole et al. to include the line interface of claimed wherein said ADSL is one of the full rate ADSL, G. Lite, CAP, and QAM as taught by Cioffi et al. in order to provide a wide variety of data transmission schemes including Asymmetric Digital Subscriber Line systems that include the transmission of signals over twisted pair, fiber and/or hybrid telephone lines, cable systems that include the transmission of signals over a coaxial cable, and digital cellular television systems that include the transmission of radio signals (as suggested by Cioffi et al., see column 3, lines 10 – 16), and to provide "high spectral efficiencies and can adaptively avoid various signal distortion and noise problems" (Cioffi, column 1, lines 23 – 25).

Regarding Claim 10, O'Toole et al. disclose the limitation of the line interface of said ADSL and said POTS coexist on said twisted pair telephone line (Fig. 6, element 58 as integrated line card, element 20, Tel line, column 7, lines 17 – 29).

Regarding Claim 11, O'Toole et al. disclose the limitation of the line interface comprising: a POTS detector circuit (Fig. 6, elements 54, Ring generator, element 56 Off-hook detector) coupled to provide a POTS usage signal to said programmable filter indicating that a POTS bandwidth is in use (Fig. 6, element 56, off-hook detector, column 7, lines 25 – 28, the phone handset is lifted off-hook to initiate a call as POTS bandwidth is in use).

Regarding Claim 13, O'Toole et al. disclose the limitation of the line interface of claimed wherein said POTS detector circuit detects whether a telephone connected to said twisted pair telephone wire is on hook or off hook (Fig. 6, element 56, off-hook detector, column 7, lines 25 – 28, the phone handset is lifted off-hook to initiate a call as telephone wire is off-hook).

Regarding claim 14, O'Toole et al. disclose the limitation of the line interface of claimed wherein said POTS detector circuit determines if a POTS signal is communicated in said ADSL bandwidth or if said POTS signal is communicated in said POTS bandwidth (Fig. 7, element 60 decimation filter, elements 60 together with elements 62, 66 performing the frequency-splitting function to split ADSL data from POTS).

Regarding claim **15**, O'Toole et al. disclose the limitation of a method of providing a plurality of services (recited Internet and PSTN as plurality of services) over a twisted pair telephone line (Fig. 6, element 20, phone line, column 7, lines 2 – 5), comprising the acts of: receiving a broadband analog signal from said twisted pair telephone line (column 7, lines 30 – 36); filtering said broadband analog signal using a programmable filter (Fig. 6, element 50, DSP as programmable filter) into a plurality of separate bands wherein said plurality of separate bands are determined by programming said filter to generate a plurality of variable bandwidth channels (recited "DSP performs a high-pass filter, the output of the high-pass digital filtering...; DSP also performs a low-pass filter,

the output of low-pass filtering ....." as output signal into a plurality of separate, variable bandwidth transmission channel); and transmitting said plurality of separate bands to a plurality of different service providers (Fig. 6, element 30, high–speed ADSL data pathway; column 8, lines 8 – 11, 54 – 55, recited for transmission to the Internet as data network; Fig. 6, element 34 PCM highway, column 8, lines 18 – 21, column 9, lines 15 – 20, recited voice in Public Switched Telephone Network as voice network, voice network and data network as different service providers).

O'Toole et al. do not disclose the limitation of configured to filter frequency bands of said output signal into a plurality of separate, variable bandwidth transmission channels.

Cioffi et al. disclose the limitation of configured to filter frequency bands of said output signal into a plurality of separate, variable bandwidth transmission channels ("inherently partitions a transmission medium into a number of sub-channels that each carry data independently. The data on each sub-channel can correspond to a different signal or can be aggregated into higher data rates" correlates to configured to filter frequency bands of said output signal into a plurality of separate, variable bandwidth transmission channels; column 7, lines 59 – 68, column 8, lines 1 – 5).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify O'Toole et al. to include configuring to filter frequency bands of said output signal into a plurality of separate, variable bandwidth transmission channels as taught by Cioffi et al. in order to provide a wide variety of data transmission schemes including Asymmetric Digital Subscriber Line systems that include the

transmission of signals over twisted pair, fiber and/or hybrid telephone lines, cable systems that include the transmission of signals over a coaxial cable, and digital cellular television systems that include the transmission of radio signals (as suggested by Cioffi et al., see column 3, lines 10 – 16), and to provide "high spectral efficiencies and can adaptively avoid various signal distortion and noise problems" (Cioffi, column 1, lines 23 – 25).

Regarding claim 16, O'Toole et al. disclose the limitation of the method of claimed wherein said separate bands are transmitted to said plurality of different service providers through a data network and a voice network (Fig. 6, element 30, high–speed ADSL data pathway; column 8, lines 8 – 11, 54 – 55, recited "for transmission to the Internet" correlates to data network; Fig. 6, element 34 PCM highway, column 8, lines 18 – 21, column 9, lines 15 – 20, recited "voice in Public Switched Telephone Network" correlates to voice network, voice network and data network as different service providers).

Regarding claim 17, O'Toole et al. discloses the limitation of the method of claimed wherein said programmable filter is upgraded by programming said filter with software (recited "the updateable flash ROM and volatile memory allow for code updates, fixes and enhancements"; column 7, lines 54 – 61).

Regarding claims 18, 20, O'Toole et al. disclose the limitation of a line interface for coupling a twisted pair telephone line with a communications network (Fig. 6, element 58 " integrated line card", element 20 " telephone line", element 30 "high-speed ADSLdata pathway" to Internet as communication network), comprising: a broadband analog front end circuit coupling said twisted pair telephone line with said line interface (Fig. 6, elements 54, 56, 59, column 31 – 36, recited these analog circuits as analog front end circuit); and a programmable filter (Fig. 6, element 50, DSP as programmable filter) coupled to receive an output signal from said broadband analog front end circuit and configured to filter frequency bands of said output signal into a plurality of different transmission channels (recited "DSP performs a high-pass filter, the output of the high-pass digital filtering...; DSP also performs a low-pass filter, the output of low-pass filtering ....." as output signal into a plurality different transmission channels) including: a first transmission channel having a first variable frequency bandwidth (DSP performs a high-pass filter, the output of the high-pass digital filtering); and a second transmission channel having a second variable frequency bandwidth (DSP also performs a low-pass filter, the output of low-pass filtering .....), wherein said programmable filter can be programmed to adjust a band edge of either said first transmission channel or said second transmission channel to increase or decrease said first and second variable frequency bandwidths, respectively (Fig. 7, bandpass filter 100Hz – 4KHz, column 9, lines 1 – 4, 42 – 43, adjusted from 8KHz to 1MHZ sample rate of ADSL data; High-pass filter > 4KHz,; column 10, lines 14 – 16, recited the DSP simply re-programmed to adjust for the different ADSL or POTS encoding schemes used (that is different bandwidth).

O'Toole et al. do not disclose the limitation of configured to filter frequency bands of said output signal into a plurality of separate, variable bandwidth transmission channels.

Cioffi et al. disclose the limitation of configured to filter frequency bands of said output signal into a plurality of separate, variable bandwidth transmission channels ("inherently partitions a transmission medium into a number of sub-channels that each carry data independently. The data on each sub-channel can correspond to a different signal or can be aggregated into higher data rates" correlates to configured to filter frequency bands of said output signal into a plurality of separate, variable bandwidth transmission channels; column 7, lines 59 – 68, column 8, lines 1 – 5).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify O'Toole et al. to include configuring to filter frequency bands of said output signal into a plurality of separate, variable bandwidth transmission channels as taught by Cioffi et al. in order to provide a wide variety of data transmission schemes including Asymmetric Digital Subscriber Line systems that include the transmission of signals over twisted pair, fiber and/or hybrid telephone lines, cable systems that include the transmission of signals over a coaxial cable, and digital cellular television systems that include the transmission of radio signals (as suggested by Cioffi et al., see column 3, lines 10 – 16), and to provide "high spectral efficiencies and can adaptively avoid various signal distortion and noise problems" (Cioffi, column 1, lines 23 – 25).

3. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over O'Toole et al. (US 5889856) and Cioffi et al. (US 6473438 B1) as applied to claims 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 13, 14, 15, 16, 17, 18, 20 above, and further in view of Bremer et al. (US 7020266 B2).

Regarding claim 12, O'Toole et al. and Cioffi et al. do not disclose the line interface of claimed wherein an ADSL bandwidth is expended to include said POTS bandwidth when said POTS usage signal indicates that said POTS bandwidth is not in use, and said ADSL bandwidth is reduced to exclude said POTS bandwidth when said POTS usage signal indicates that said POTS bandwidth is in use.

Bremer et al. disclose the limitation of wherein an ADSL bandwidth is expended to include said POTS bandwidth when said POTS usage signal indicates that said POTS bandwidth is not in use (recited "may utilize the frequency band otherwise allocated for POTS/voice transmission, at times when there is no present demand for transmitting voice information" correlates to an ADSL bandwidth is expended to include said POTS bandwidth when said POTS usage signal indicates that said POTS bandwidth is not in use; Fig. 9, column 9, lines 11 – 14), and said ADSL bandwidth is reduced to exclude said POTS bandwidth when said POTS usage signal indicates that said POTS bandwidth is in use (Fig. 9, column 9, lines 14 – 20).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify O'Toole et al. and Bremer et al. to include wherein an ADSL bandwidth is expended to include said POTS bandwidth when said POTS usage signal indicates that said POTS bandwidth is not in use, and said ADSL bandwidth is

reduced to exclude said POTS bandwidth when said POTS usage signal indicates that said POTS bandwidth is in use such as that taught by Bremer et al. in order to provide an apparatus and method for enabling a plurality of analog and digital sets of services that can be utilized simultaneously on a single telephone line (as suggested by Bremer et al., see column 1, lines 14 – 17) to avoid interference and efficient use of bandwidth.

Allowable Subject Matter

4. Claims 19, 21 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

5. Applicant's arguments filed on 9/05/2006 with respect to claims 1 – 21 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- Timm et al. (US 6522730 B1) disclose DSL communication system with improved bandwidth.

- Chow et al. (5479447) disclose a method and apparatus for adaptive, variable bandwidth, high-speed data transmission of a multicarrier signal over digital subscriber lines.
- Liu et al. (6065060) disclose a high speed modem is provided which targets the use of a selectable, desirable portion of the total available bandwidth of a channel for achieving a data rate which nevertheless far exceeds that of conventional voice-band modems.
- Harris et al. (5325318) disclose a variable digital filter employs a variable rate sample clock with combinations of various digital filter elements such as an efficient implementation of decimation to achieve various filter realizations allowing a selectable output bandwidth.
- Michaels (US 6608842 B2) disclose an apparatus for facilitating combined POTS and xDSL services at a customer premises.
- Bremer et al. (US 6546090 B1) disclose a method and system are provided for communicating voice and data across a communication link, in a manner that senses and dynamically adapts to the simultaneous transmission of voice information across the local loop.
- Wu (6002722) disclose a modem operating selectively in the voice frequency and higher frequency bands which supports multiple line codes. A DSP is used to implement different existing ADSL line codes on the same hardware platform.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew C. Lee whose telephone number is (571) 272-3131. The examiner can normally be reached on Monday through Friday from 8:30am - 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wing Chan can be reached on (571) 272-7493. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Andrew C. Lee/::<5/06/2007>

WING CHAN
SUPERVISORY PATENT EXAMINER